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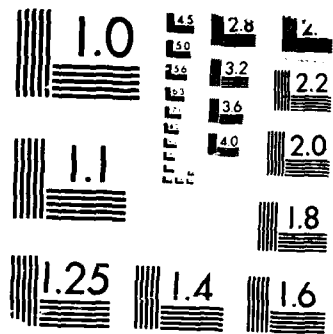
MULTICRITERIA INTEGER PROGRAMMING FOR PROBLEMS
INVOLVING LINEAR AND NONLINEAR UTILITY FUNCTIONS(U)
STATE UNIV OF NEW YORK AT BUFFALO AMHERST
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OFFICE OF NAVAL RESEARCH

FINAL REPORT

FOR

Contract N00014-85-K-0609

Task No. NR 541-011

Multicriteria Integer Programming for Problems Involving
Linear and Nonlinear Utility Functions

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May 6, 1988

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This is a final report on Office of Naval Research Grant Number N00014-85-K-0609 (Task No. NR 541-011 and State University of New York Research Foundation number 150-6525A). Our project was titled, "Multicriteria Integer Programming for Problems Involving Linear and Nonlinear Utility Functions."

Two students were supported during the academic year 1985-86. Mr. Hae Wang Chung, a student in the School of Management was supported for the fall semester, 1985. He has completed his dissertation, "Investigation of Discrete Multiple Criteria Decision Making and an Application to Home Buying," and successfully defended his dissertation August 11, 1986. The second student, Mr. N.R. Natraj, a Ph.D. student in the Department of Industrial Engineering was supported for the entire academic year, 1985 - 1986. Mr. Natraj left at the end of the year.

During the 1986 - 87 academic year, we supported Mr. Jeffrey Teich, a Ph.D. student in the School of Management and Mr. Srinivas Prasad, a Ph.D. student in the Department of Industrial Engineering. Mr. Teich should propose his doctoral dissertation within the next six months. Mr. Prasad has almost completed his M.S. degree and should also propose his doctoral dissertation within the next six months.

Numerous papers were completed under the grant. These include the Ph.D. thesis of Mr. Chung, and the M.S. thesis of Mr. Prasad. We list these reports and publications below:

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R. Ramesh, M.H. Karwan and S. Zionts, "A Class of Practical Interactive Branch and Bound Algorithms for Multicriteria Integer Programming," Working Paper 638, School of Management, State University of New York at Buffalo, 1985. Published in European Journal of Operations Research, Vol. 26, No. 1, pp. 161-172 (1986).

R. Ramesh, M.H. Karwan and S. Zionts, "Preference Structure Representation Using Convex Cones in Multicriteria Integer Programming," Working Paper 646, School of Management, State University of New York at Buffalo, 1985. Submitted to Management Science.

R. Ramesh, M.H. Karwan and S. Zionts, "An Efficient Interactive Solution Framework for Bicriteria Integer Programming," Working Paper 668, School of Management, State University of New York at Buffalo, 1986. Revised and submitted as "Interactive Bicriteria Integer Programming: Theory and Experimental Results," to IIE Transactions.

Chung, Hae W. (Ph.D. Dissertation), Investigation of Discrete Multiple Criteria Decision Making and an Application to Home Buying, SUNY/Buffalo, September 1986.

Ramesh, R., M.H. Karwan and S. Zionts, "Theory of Convex Cones in Multicriteria Decision Making," forthcoming in Annals of Operations Research (1987).

Ramesh, R., M.H. Karwan and S. Zionts, "Interactive Multicriteria Linear Programming: An Extension of the Method of Zionts and Wallenius" forthcoming in Naval Research Logistics (1987).

Ramesh, R., M.H. Karwan, and S. Zionts, "An Empirical Assessment and Insights on Two Multicriteria Integer Programming Algorithms," in Y. Sawaragi (Ed.), Multiple Criteria Decision Making - Towards Interactive and Intelligent Decision Support Systems, Springer-Verlag (1987).

Ramesh, R., M.H. Karwan, and S. Zionts, "Degeneracy in Efficiency Testing in Bicriteria Integer Programming," Proceedings of the International Workshop on Methodology and Software for Interactive Decision Support, Albena, Bulgaria, published by the International Institute for Applied Systems Analysis (IIASA), Austria (1987).

Koksalan, M., M.H. Karwan, and S. Zionts, "Approaches for Discrete Alternative Multiple Criteria Problems for Different Types of Criteria," IIE Transactions, 18, 3, 1986, pp. 262-270.

Karwan, M.H., S. Zionts, B. Villareal and R. Ramesh, "An Improved Interactive Multicriteria Integer Programming Algorithm," in Haimes, Y.Y., and Chankong, V., Decision Making with Multiple Objectives, Proceedings, Cleveland, Ohio, 1984, Springer-Verlag, Berlin, 1985, pp. 261-271, supported in part by the State University of New York at Buffalo.

Koksalan, M., M.H. Karwan and S. Zionts, "An Approach for Solving Discrete Alternative Multiple Criteria Problems Involving Ordinal Criteria," Forthcoming in Naval Research Logistics (1988).

Prasad, S., (M.S. Thesis) Use of Convex Cones in Solving Multiple Criteria Linear Programming Problems. Department of Industrial Engineering, SUNY/Buffalo, June 1988.

Following are some presentations supported by this grant:

Ramesh, R., M.H. Karwan and S. Zionts, A Class of Practical Interactive Branch and Bound Algorithms for Multi-criteria Integer Programming, Second Euro Summer Institute, Belgium, July 1985.

Ramesh, R., M.H. Karwan and S. Zionts, Preference Structure Representation Using Convex Cones in Multicriteria Integer Programming, ORSA/TIMS Joint National Meeting, LA, April 1986.

Chung, H.W., M.H. Karwan and S. Zionts, A Discrete Alternative Multiple Criteria Method, ORSA/TIMS Joint National Meeting, Miami Beach, October 1986.

Ramesh, R., M.H. Karwan, S. Zionts and S. Prasad, An Interactive Multicriteria Linear Programming Method Using Constraints and Convex Cones, ORSA/TIMS Joint National Meeting, St. Louis, October 1987.

Chung, Hae W., M.H. Karwan and S. Zionts, A Decision Support System for Home Buyers: An MCDM Application, ORSA/TIMS Joint National Meeting, St. Louis, October 1987.

Ramesh, R., M.H. Karwan and S. Zionts, Degeneracy in Efficiency Testing in Bicriteria Integer Programming, ORSA/TIMS Joint National Meeting, St. Louis, October 1987.

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